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PBL IN PRESERVICE TEACHER EDUCATION

Eugene Matusov, John St. Julien, and James A. Whitson

Chapter Summary

Two courses in the preservice elementary teacher education were revised, initially, to develop models that might be used throughout the program. While useful models were developed in a variety of problems within these courses, the instructors conclude that differences between "schoolish" and authentic problems are more essential to the success of problem-based learning (PBL) than are the "models" provided by successful PBL problems and courses.

Introduction

In this chapter, we reporr and discuss our experience revising two courses in the undergraduate program in elementary teacher education. We initially intended that these two revised courses might provide models for using PBL in preservice reacher education-models that could be replicated throughout other courses in our ETE program. Our experience leads us to conclude, however, that although effective PBL problems or courses do provide models that might be adopted and adapted in designing other effective problems and courses, it is a mistake to focus on these models, forms, and design structures as the kev to effectiveness in PBL.

From the "Model Problem" to the "Model" Problem

There is a crucial difference between our project and others reported in this volume. While others provide models for using PBL in teaching physics, biology, nursing, and other disciplines, we are attempting to assist our students in their own preparation as teachers, so they will be able and disposed to use PBL in teaching social studies, reading, science, and math to their own students in the elementary grades. Hence, while our courses might be seen as providing models for the use of PBL in other college education courses; within our courses, we were also setting out to model PBL as an approach that our own students could use in their elementary school teaching.

Modeling PBL in the Elementary Social Studies "Methods" Class

In survey after survey, elementary and secondary students invariably identify social studies as the school subject they like least (or dislike most). This is routinely attributed to, the familiar practice of teaching history, geography, or civics by having students read one chapter after another in their textbook, without any motivation other than curricular mandates, and then answer questions found at the end of each textbook chapter.

The challenge of designing and implementing units on a wide variety of social studies topic areas, in ways that are interesting, engaging, and effective for student learning, is a huge problem for elementary school teachers. Our students face this challenge in the form of their requirement to design and teach a social studies unit in the elementary or middle school classroom where they have been placed for the semester. The topic for their unit is determined by the curriculum for the classroom in which each pair of our students has been placed. In other words, a team of two preservice teachers may be responsible for planning and teaching a unit on a topic area in history, geography, civics, or economics that they may never have studied in their own college or precollege careers and that may be different from the topics to be taught by any of their classmates in the methods course.

As noted earlier, the routine or default way of dealing with this problem is reliance on the textbook. Our students have always known that this would not work for them, simply because it would not satisfy their professor in the college methods class. Before our revision of the course using PBL, students generally tried to deal with this challenge by brainstorming and scrounging around for activities related to their topics that would be more fun and more engaging than a slavish reliance on the textbook. Often, they did come up with clever and inventive ideas for activities that could really be a lot of fun for their

students. Almost as often, though, it would be hard to see the value of those activities-beyond their entertainment value-in terms of learning outcomes that would result for their students. Moreover, when their units did include activities that could be expected to produce some real learning benefits for their elementary or middle school students, those activities often did not build on one another in a progressive or coherent way to advance the students' understanding of the topic or their ability to understand comparable topics in the social studies subjects.

Preservice teacher education students are often at a loss to understand why plans like this will not receive the grade they feel that they deserve, and the students feel that they are entitled to be told explicitly what they need to do to earn an "A." The directions they seek, and typically are given, often take the form of formalistic criteria, such as the number of "objectives" to be stated for each lesson in the unit; how many of these objectives should be stated in the form of Bloom's (Bloom, 1956) "higher level" objectives; how many different student grouping arrangements, or types of student activities, should be included over the course of the unit; how many (and what types) of resources should be included in their list of references for the unit, etc.

Of course, there is a good chance that explicit and detailed directions of this kind will result in better units being designed by methods students. This, however, fails to solve the problem of the methods course itself, since those "better units" might be produced by students who have only learned how to follow formalistic directions and not how to design their own units on the basis of their own assessment of how to treat a given social studies topic in a way that will be most beneficial for the students in their classrooms later in their careers. This prospect can be seen, in fact, in the units that have met *all* the formalistic criteria (number and variety of activities, etc.) but still fail to add up to a coherent unit that will provide real learning benefits for the elementary school students. In these cases (and even in many cases where those formalistic directions actually *did* result in better unit plans), the problem that the preservice teacher education students were focusing on, and the problem that motivated and organized their efforts, was the "schoolish" problem of how to satisfy their professor, rather than the authentic problem of how to design the most effective unit to promote learning by their elementary school students.

We were able to transform this situation by revising our course using PBL. Instead of giving them formalistic criteria for better unit plans and then letting them focus on the "schoolish" problem of how to satisfy our criteria, we let them take on, for themselves, the problem of designing their best unit on their topic for their students—and the constituent problem of figuring out

the standards, criteria, and requirements demanded by that task. Instead of them asking us how many objectives should be stated in each lesson plan, or how many and what kinds of resources would be required for their unit, we would now ask them to figure out the answers to such question in the course of working through their own problem of designing their best unit on the topic for their students.

Of course, we could not do this just by telling them, "It's your problem now, you need to figure it all out for yourselves." That is precisely what they needed to learn how to do in our class, and what they had never before learned how to do. This is, however, where the PBL model would provide just the help that they would need.

Our plan was that we would introduce a PBL model for group problem solving at the beginning of the course and then provide problems that would serve as opportunities for them to practice using this PBL model over the semester-with at least one extended problem that would serve almost as a direct rehearsal for the culminating problem of their final unit plans.

We first introduced PBL to our students, at the beginning of their social studies methods class, by giving them a version of the plea negotiation problem that had been developed by Dr. Valerie Hans for a course in criminal justice at the University of Delaware (UD) (see Chapter 13 of this volume for discussion of the Plea Negotiation problem). For about two weeks, along with reading and discussing other introductory materials for the course, our students worked in four-member negotiating groups as prosecutors, defendants, defense counsel, and surviving victims, doing research on criminal and case law, sentencing guidelines, and conflicting arguments on public policy, while negotiating toward a plea agreement within each of their groups. We intended that this process would provide a model that our students could use in groups working through other problems throughout this course, and in their careers, including their final social studies unit plans for the semester.

We also intended that by working through the Plea Negotiation problem, they would get the experience of PBL learning with a problem designed for students at their own (i.e., college undergraduate) level, which could serve as helpful background for them in designing PBL experiences for students in the elementary and middle school grades. This also provided an opportunity for reflecting on the importance of specific learning goals as the basis for how any given problem should be used. In this case, our students could see that the same Plea Negotiation problem could be appropriate in both the criminal justice and the social studies classes but that it should be used differently to serve the differing purposes of each class. Criminal justice majors are learning how to perform the roles within that system, so some aspects of the process may

have more importance in that context. As an opportunity for learning about civics within the elementary or middle school social studies curriculum, however, it would be more important for students to discover how the three branches of government interact within particular cases, such as this one, to serve and protect the conflicting principles, values, and interests that our governmental and legal systems are designed to orchestrate.

After their introduction to this PBL model with the Plea Negotiation problem, our students were given a larger problem to work on over several weeks, in which they worked together in planning units or lessons on a topic area shared by the entire class. In the spring semester of 1999, the topic area was presidential impeachment. This really was a problem area for elementary school teachers at the time. Children were hearing about impeachment at home, on the streets, and in the news. On the one hand, this generated a level of interest and curiosity that would normally be a teacher's greatest asset. On the other hand, some of the seamier and more controversial aspects of the conflict over President Bill Clinton's impeachment made the topic seem extremely perilous to many grade school teachers. Children would not let this topic simply be ignored (and an attempt to do so would have taught the children questionable lessons in any case), and the topic involved so much rich content in history, government, and politics that in some ways this was a social studiex teacher's dream come true. How could this topic be handled, with particular classes of grade school children? This was the problem that our students grappled with that semester. Since all groups in the class were working in the same problem area, they could discover from each other the wide variety of possible approaches to a single topic. It also was possible to provide more coaching, scaffolding, and peer support for everyone, while they could work through a unit planning process that was almost a rehearsal for their research and development of final social studies unit plans, which each pair of methods students would need to work on more independently.

Beyond Modeling: Instructional Strategies and Reflective Practices

Instructional Strategies and Reflective Practices (ISRP) is a course that focuses on instructional strategies, classroom management, lesson plans, and educational philosophies. One concern in this class is for students to learn how to provide sensitive guidance for all children with diverse educational needs. Students often raise this issue of dealing with "slow learners" in their teaching practicum associated with this class, while providing challenging instruction for all of the children. Many believe that the only way to provide sensitive

guidance is through one-on-one teaching or through tracking children by their abilities. However, they know that one-on-one teaching or tracking is logistically not always possible in the classroom. Besides, many of these students are aware of negative consequences of tracking, which has often resulted in an increasing gap between "high" and "low" tracks, and in low-track children being stigmatized and losing self-esteem and motivation for their academic learning.

Having participated in the UD Winter Institute, the instructor was eager to design a PBL unit in which students would develop sensitive instruction for a group of children with diverse levels of educational abilities and skills. As a model for designing this unit, the instructor referred to the Plea Negotiation problem (discussed previously) that had been used as an introduction to PBL for faculty participants during the first two days of the Institute. Along with the other Institute participants, we were all impressed by the design of the plea negotiation problem and its effectiveness as a learning experience within the Institute. On this basis, it appeared that the Plea Negotiation problem provided an exemplary design that could be directly replicated in designing a problem on sensitive guidance and instruction for diverse learners. Unlike the social studies methods course discussed previously, in which the Plea Negotiation problem itself was given to the students for them to work through, in this case the students were not given that problem to work on. In this case, the instructor looked to the design of the Plea Negotiation problem as a model for the design of a different problem for this class.

Following the Plea Negotiation problem as a model, the instructor developed a problematic scenario that he calls the "Sitting Disability" problem. According to this scenario, the second grade teacher referred her student, Mike, for medication, because of his assumed Attention Deficit Disorder ADD) problem evident in his distracting other children in the class during ndependent reading/writing classroom activities. From time to time the stulent was taken from class to learn the alphabet because he could not read or vrite. It was suspected that the student's distracting behavior was not caused by ADD but was his way of trying to get help (or some alternative activities) rom his classmates in the reading/writing classroom activities, in which he ould not participate on his own.

Following the model of the Plea Negotiation problem, the scenario for this roblem described four specialists: an instruction specialist, a curriculum specialist, a child psychologist, and a language arts specialist, who are supposed o design a language arts lesson (or an unit) for a group of second grade stulents, including Mike, that should involve sensitive guidance for all the stulents in the group.

The rest of the two-week Sitting Disability unit followed the structure of the Plea Negotiation problem and involved class meetings of the four specialist teams, their work outside of the class using Internet sources to address questions that emerged in the teams' meetings, team meetings in class for bringing information together, and finally, reassembling the groups to design an inclusive language arts lesson.

The unit did not work. Students complained about the work required outside of class (despite the fact that they did weekly miniprojects at home on a regular basis); they asked how many questions minimum each student should take care of and how much writing they should do in reply to the questions; student questions were very shallow; they cut and pasted texts from suggested Internet websites without much thinking about whether and how the texts address their questions; they never went beyond the suggested websites; they worried how much the group project would contribute to the final grade for the class for each group member; their designs for inclusive lessons were not informed by the searches they did and were reduced to tracking at best and to low-quality drills in reading and writing at worst; and so forth. It was anything but active learning. It was a somewhat torturous experience of getting through, for them and the instructor.

Why? Why did the model work so beautifully for Dr. Hans in criminal justice and so badly for us in this course? Of course, we could focus on differences in educational attitudes and motivation between criminal justice and education students, and blame our students for being lazy, dull, and disinterested—PBL was simply not for them. We know, however, that this would not be true, fair, or productive. What makes the difference between successful PBL and its failure? We know that the answer is not in the structure of the PBL lesson, since that was directly copied from the model of the Plea Negotiation lesson. We could blame the instructor for ineffective implementation of a basically good model. Our reflection on this experience, however, convinces us that a focus on the structure of successful PBL problems, taken as models, is not the key for understanding what will make the difference between successful and unsuccessful uses of PBL.

PBL is often discussed in terms that suggest there is a choice to be made between problem-based learning and learning that is not problem-based. We would argue to the contrary that ***all learning is problem-based.*** The question is not ***whether*** learning will be problem-based or not, but rather ***what kind*** of problem will motivate and determine students' learning. Will student efforts be addressing "schoolish" problems (e.g., problems of figuring out how to satisfy the instructor's arbitrary requirements with a minimum of effort), or authentic problems (e.g., for our preservice teacher education students, the

real problems they will be dealing with as teachers, as well as-in the case of social studies, for example-real problems in the social world or in the history and social science disciplines)?

In the case of the Plea Negotiation problem, both the instructor's and the students' concerns centered on the plea negotiation issues. In contrast, in the case of the Sitting Disability problem, despite the fact that the problem was structured on the same model, the instructor's and students' concerns were mutually exclusive to each other and did not consider each other as legitimate. Of course, the instructor's and students' concerns are not the same and should not be the same because the instructor is supposed to focus on guiding the students, while the students are supposed to focus on learning and on accomplishing learning activities. However, the relationship between the instructor's and students' concerns has to be shared, supportive, compatible, and open for public negotiation in the class to make PBL authentic. *PBL emerges from the relationship between the instructor3 and students' concerns in the classroom activities—this relationship defines whether PBL is "schoolish" or authentic.*

In the Sitting Disability lesson, the instructor worked against, rejected, and overruled the students' vision of how to provide sensitive guidance for children with diverse educational needs, rather than working with students' visions of the problem. The starting point of the Sitting Disability lesson was for the students to reject their own approach to sensitive guidance resulting in tracking and one-on-one tutoring and, instead, to focus on the instructor's agenda of how to design inclusive guidance in this problematic situation. The students were precluded from working on the real problem, as they understood it, so instead they devoted their efforts to the "schoolish" problem of satisfying the demands of their instructor.

Based on this analysis of the experience with PBL in ISRP one semester, the instructor revised the use of PBL for the following semester, with a focus on working *with* students' concerns and visions rather than struggling *against* them. For example, at the very beginning of the teaching practicum, the instructor asked the students to discuss with children in their elementary school classes what their favorite book is in their class and then to reflect on this learning activity. The students' opinions about the activity were split from high excitement and endorsing the activity as extremely educational, to disparagement of the activity as having very low educational value.

In the next class meeting, each group was asked to report on pedagogical aspects of the activity, such as pedagogical values, classroom management, organizational transitions, concerns and problems that they had, and the children had had, during the favorite book activity, and their emerging relations with the children. To their surprise, their replies fell into the two patterns that

fit the two groups. For example, the group that considered the activity as successful emphasized how their children were supportive, cooperative, and collaborative, while the other group reported disciplinary problems.

When the activity profiles for the two groups were completed, the students shifted their attention to why these two different patterns occurred. Initially, some students suggested that the difference was in the children, since the activity was the same. However, many students quickly noticed that the activities actually were not the same! In the group where the activity was successful, the activity goals for the children centered on sharing their favorite books with their classmates and on persuasive speech. In the group where the activity was not successful, the activity goals for the children centered on competition and on imposing their choices on the other children.

After the class, many students commented that they were surprised to learn so much from the their own unsuccessful teaching activity. Students in this activity repeated to some degree their instructor's own teaching experience, described previously. At this point, they join the community of educators learning how to design authentic PBL in their classrooms.

Assessment of Student Learning

Assessment of student learning in the courses has been done partly on the basis of the same kinds of student products that have been used for grading purposes in the past. For example, students have continued to develop and implement lesson plans and unit plans in social studies, which must not only demonstrate mastery of the principles of curriculum design and planning for instruction, but must also demonstrate an understanding of teacher strategies for addressing the problems that elementary school students have in mastering the skills and conceptual content of social studies subjects, such as civics, history, geography, and economics. We believe that such products from the past two semesters demonstrate superior mastery as compared with comparable products from previous semesters.

The most striking improvement in student learning was seen in their final units and in their lesson plans for teaching. ECSS is the course in the final block before student teaching in which units are required. As such it has traditionally been the first place where a large number of the complex elements of teaching and curriculum design are brought together in the production of a practical project. Short of student teaching itself, this can be regarded as the capstone activity of the student's academic career of on-campus coursework prior to their student teaching, and as a foundation for their student teaching internships. To construct a viable unit the lessons must be sequenced, build

students emerging competencies and provide a satisfying way for students to become aware of their own developing abilities. It is hardly surprising that students regard this as one of the most difficult tasks they engage in, and it is disappointing that professors generally find many of the same problems in student units year after year and in different institutions.

One important difference in the PBL approach is that it naturally lends itself to engaging students in assessing the value and quality of their own learning in the course of their problem-based learning experiences. With PBL, students' decisions about how to respond to problematic situations will depend upon their own active deliberations on the differences between more and less worthy solutions to the embedded problems and the criteria upon which such judgments should be based. In the PBL-revised course, teacher education students have been discovering how student learning can be enhanced through ongoing engagement in assessing the quality and value of their own work and their accomplishments, through informal communication, as well as more formal assessment rubrics. This also supplies them with strategies for engaging their own students in the active assessment of learning in their elementary school classrooms.

Student units in the last two semesters have shown a dramatic improvement in quality in our judgment. Most noticeably, they are more likely to be designed around issues that are actually meaningful, even when the cooperating teacher in the student's field placement dictates the topic. Individual lessons are better written, and the unit is more likely to clearly build, and build on, the emerging abilities of those taught. The complex of reasons for this improvement is difficult to trace in detail, but preliminary analysis appears to show that they are related to the PBL portions of the class.

In the course ISRP, students were assigned an open-ended essay in which they were to reflect on what they've learned in the class. Student statements in the essays were analyzed and tabulated (see Table 20.1), showing that students from PBL classes mentioned that they learned more and experienced richer curricula than students from non-PBL class.

Outcomes

At the beginning of this project, we expected that we would see our students designing PBL problems for the elementary school children in their practicum and (later) student teaching placements, and that this would be the ultimate test of our own project. Although we have seen some impressive PBL units designed and implemented by our students in their practica, our students are still more often designing units that would not be recognized as PBL in the

Table 20.1. Tabulated Results from Student Reflection Essays

Important Aspects of the Class Mentioned by the Students	PBL, *N*=21	Non-PBL, *N*=24	P-value, T-test
1. Sharing practicum experiences, ideas, and problems	81%	88%	0.2805
2. Student wants to use the strategies learned in the class in her or his future teaching	57%	21%	0.0 127
3. Appreciation of cooperative learning and learning through collaboration	48%	17%	0.0144
4. Discussion of educational philosophies	62%	4%	0.0051
5. Discussion of children's active learning (including PBL)	71%	8%	0.0000
6. Diversity of views and different ways of dealing with problems	33%	25%	0.2758
7. Considering pros and cons of educational strategies, critical thinking	24%	4%	0.0347
8. Focusing on shared ownership for decision making	19%	0%	0.0211
9. Value of reflection	52%	21%	0.0151
10. Discussion of problems and problematic situations	33%	8%	0.0229
11. Educational eclecticism (let's mix all educational philosophies together)'	0%	17%	0.0214
12. Diversity of ways that students learn	24%	4%	0.0321
13. Focus on learning and not on grade	5%	4%	0.4628
14. Stressless class	24%	17%	0.2822
15. Diversity of teaching styles and techniques	76%	17%	0.0000
16. Flexible and open-minded teaching	24%	4%	0.0347

*This item indicates the students' lack of understanding of educational philosophy according to the instructor.

P-value < 0.05 Indicates items with statistically significant differences between the classes.

(continued)

Table 20.1. Tabulated Results from Student Reflection Essays-continued

Important Aspects of the Class Mentioned by the Students	PBL, N=21	Non-PBL, N=24	P-value, T-test
17. Report a dramatic change in student's perspectives, beliefs, and attitudes	**52%**	**0%**	0.0001
18. Critique of transmission of knowledge educational approach	**24%**	**0%**	**0.0106**
19. Reasoning and backing up ideas and opinions in the essay	**43%**	**0%**	**0.0004**
20. Appreciation of learning through PBL and teaching activities in the class	**76%**	**0%**	**0.0000**
21. Appreciation of support from the classmates, feeling of a community	**48%**	**0%**	**0.0002**
22. Increased confidence in teaching	**24%**	**0%**	0.0106
23. Emphasis on a connection between instruction and learning	**29%**	**0%**	**0.0052**
24. Positive attitude toward the class	**100%**	**75%**	**0.0055**
Average number of the items mentioned by each student	**11.0**	**3.5**	**0.0000**

'This item indicates the srudents' lack of understanding of educational philosophy according to the instructor.
P-value < 0.05 indicates items with statistically significant differences between the classes.

classic sense. We do see this as a continuing challenge for our work in these courses and the larger ETE program: i.e., the "problem" of using PBL within our program more effectively in ways that will result in greater use of PBL by our students and our graduates in their own classrooms.

At the same time, we already do see impressive positive results in other forms. As we have revised our courses using PBL, we have found that-even when they are not using a "model" of PBL problems as such-our students are engaged in working more authentically on the real problems of curriculum and instruction, rather than the "schooiish" problems of satisfying course requirements. In designing social studies units, students are far more engaged now than before with the nexus of (a) social and historical problems embedded in the social studies content, (b) the problems that will actually be experienced by their students in the conduct of their lessons, and (c) the teacher's problems of designing experiences for students so that the elementary school students will be progressively developing their capacities for dealing with real historical and social problems while meeting the requirements of state-mandated curricula and standards-driven testing programs.

Suggestions for Adoption

Successful PBL involves more than just repackaging the content of traditional lectures into problematic scenarios and group work; it requires a transformation of students' experiences, concerns, and visions. Authentic PBL lessons can come as direct replies to students' concerns from their practicum, or from experiences initiated by the instructor. In any case, the students' experiences, concerns, and visions are in the center of the classroom activities being accepted, legitimatized, and problematized by the instructor. This seems to make the difference between "schoolish" and authentic PBL.

Authors' Biographies

Eugene Matusov and John St. Julien are Assistant Professors, and James A. Whitson is Associate Professor of Education at the University of Delaware.

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